## DETAILED ACTION

**1.**      This Office Action is in response to the Amendments/Remarks submitted 02 May 2008.

**2.**      Claims 1-29 have been presented for examination. Claim 29 is new.

## Response to Arguments

**3.**      Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new

ground(s) of rejection.

**4.**      In view of Applicant's amendments, the 35 U.S.C. 101 rejection is withdrawn.

**5.**      In view of Applicant's amendments, the 35 U.S.C. 112 rejection is withdrawn.

## Claim Objections

**6.**      Claim 29 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further

limit the subject matter of a previous claim.  Applicant is required to cancel the claim(s), or amend the claim(s) to

place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 recites a tangible

medium, and as per the specification, a tangible medium is defined as tangible media including floppy disks,

removable hard disks, optical storage media such as CD-ROMS and bar codes, semiconductor memories such as

flash memories, read-only-memories (ROMS), battery-backed volatile memories, networked storage devices, and

the like. Claim 29 duplicates this definition and does not further limit claim 1.

## Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to
> which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the
> best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

**7.**      **Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to

particularly point out and distinctly claim the subject matter which applicant regards as the invention. **Claim 1**

recites a system claim that can include either a processor or a tangible medium. However, a system claim

comprising a processor is an apparatus claim and a system claim comprising a tangible medium is a computer

product claim. It is unclear what statutory category the claim falls under.

## Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8.      **Claims 1-7 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory

subject matter. **Claim 1** recites a system claim that can include either a processor or a tangible medium. However, a

system claim comprising a processor is an apparatus claim and a system claim comprising a tangible medium is a

computer product claim. It is unclear what statutory category the claim falls under.

## Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the

rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.      **Claims 1-5, 7-12, 14-25 and 27-29 are rejected under 35 U.S.C. 102(b)** as being anticipated by

**Slambrook ("Three Dimensional Visualization to Support Command and Control").**

**Regarding claims 1 and 27:**

        **Slambrook discloses** a visualization system for developing a three-dimensional representation of a space

system comprising a processor comprising:

                a.    a positioning portion configured to determine a position of a viewer with respect to a real world

                      **(section 2.3.2 input sensors detect head position)** and a position of the viewer with respect to a

                      virtual world **(section 2.3.2 head position used to determine perspective in virtual world)**, the

                      positioning portion configured to allow the viewer to interact with the virtual world **(figure 2)**

b.  a modeling portion configured to specify the virtual world in response to a space system model of the virtual world **(section 2.3.5.2; figure 2),** the space system model including models for the earth and satellites **(section 4)**

c.  a model specification portion configured to specify a representation of satellite status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to the satellite status data of the satellites **(section 2.3.5.2; section 4; figure 2)**

d.  an output portion configured to provide a three dimensional representation of a space system **(title),** the three-dimensional representation of the space system including an image of the virtual super-imposed on an image of the real world **(section 2.3.3),** the image of the virtual world including the representation of the satellite model status data of the satellites to the viewer in response to the position of the viewer with respect to the virtual world **(sections 2.3.2 and 4),** the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits **(figure 4),** the image of the virtual world including a three-dimensional representation **(title)** of the models for the earth and the satellites **(figures 3 and 4).**

e.  wherein the representation of the satellite data of the satellites further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data **(section 4; figures 4 and 5).**

Regarding **claim 27,** the "object" in this claim is equivalent to the "satellite" in claim 1. **Slambrook discloses** an input portion configured to allow the viewer to select a satellite to view satellite model status data of the satellite **(section 4)** and configured to allow the viewer to direct the satellite to move to a different position **(sections 1.1 and 2.2).**

**Regarding claims 2, 9 and 16:**

**Slambrook teaches** an augmented reality system including:

a.  an image acquisition source configured to capture at least an image comprising an image of the real world **(section 2.2),** and an image of at least a pre-determined marker positioned in the real world **(section 1.1)**

   b. wherein the positioning portion comprises:

     i. an image processing portion configured to determine the position of the viewer with

      respect to the read world in response to the image of the pre-determined marker

      **(sections 1.1 and 2.3.3)**

     ii. virtual positioning portion configured to translate the position of the viewer in the

      real world to the position of the viewer in the virtual world **(section 2.3.2)**

**Regarding claims 3 and 10:**

  **Slambrook discloses** the visualization system of claim 1 wherein the model of the virtual world is a multi-dimensional model of the virtual world **(title)** and the output portion in a multi-dimensional output portion **(title; section 1.1).**

**Regarding claims 4, 11, 17 and 28:**

  **Slambrook discloses** the visualization system of claim 1 wherein the representation of the satellite model status data comprises a representation of the current position, coverage analysis, communication link and satellite systems status **(section 4).**

**Regarding claims 5, 12 and 18:**

  **Slambrook discloses** the visualization system of claim 1 wherein the three-dimensional output portion comprises a heads-up pair of glasses **(table 1).**

**Regarding claims 7 and 14:**

  **Slambrook discloses** the visualization system of claim 5 wherein the heads-up pair of glasses are also configured to allow the viewer to view the image of the virtual world super-imposed on the image of the real world **(section 2.2).**

**Regarding claim 8:**

**Slambrook discloses** a method for visualization of augmented reality to develop a three-dimensional representation of a space system, the method comprising:

a.  determine a position of a viewer with respect to a real world **(section 2.3.2 input sensors detect head position)** and a position of the viewer with respect to a virtual world **(section 2.3.2 head position used to determine perspective in virtual world)**, the positioning portion configured to allow the viewer to interact with the virtual world **(figure 2)**

b.  determining a space system model of the virtual world **(section 2.3.5.2; figure 2)**, the space system model including models for the earth and satellites **(section 4)**

c.  determining a representation of satellite model status data of the satellites in response to the position of the viewer with respect to the virtual world and in response to the satellite model status data of the satellites **(section 2.3.5.2; section 4; figure 2)**

d.  displaying to the viewer a three dimensional representation **(title)** of a space system, the three-dimensional representation of the space system including a representation of the virtual world super-imposed on a representation of the real world **(sections 2.2 and 2.3.3)**, the representation of the virtual world including the representation of the satellite status data of the satellites in response to the position of the viewer with respect to the virtual world **(section 4)**, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits **(figure 4)**, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites **(figures 3 and 4)**

e.  wherein the representation of the satellite data further comprises a representation selected from the group: satellite sensor orientation, satellite sensor position, and satellite system design data **(section 4; figures 4 and 5).**

**Regarding claim 15:**

**Slambrook discloses** a visualization method for developing a three-dimensional representation of a space system comprising:

    a.    determining a space system model of a virtual world **(sections 2.2 and 2.3.5.2; figure 4)**, the space system model including models for the earth and satellites **(section 4)**

    b.    determining a representation of satellite model status data of the satellites in response to satellite model status data of the satellites and in response to a position of a viewer with respect to the virtual world **(section 2.3.5.2; section 4; figure 2)**

    c.    determining a representation of the virtual world in response to the space system model of the virtual world and in response to a position of the viewer with respect to the virtual world **(section 2.3.5.2; section 4; figure 2)**

    d.    displaying to the viewer a three-dimensional representation of a space system **(title)**, the representation of the space system including a representation of a real world overlaid with the representation of a virtual world **(sections 2.2 and 2.3.3)**, the representation of the virtual world including the representation of the satellite model status data of the satellites **(section 4)**, the representation of the satellite model status data of the satellites including a three-dimensional representation of satellite orbits **(figure 4)**, the image of the virtual world including a three-dimensional representation of the models for the earth and the satellites **(title; section 4)**

    e.    selecting one of the satellites, by the viewer, to view satellite model status data of the satellite **(section 2.3.5.1)**

    f.    directing the selected one of the satellites, by the viewer, to move to a different position **(section 1.1)**

    g.    wherein the viewer is allowed to interact with the virtual world **(section 1.1; figure 2)**

**Regarding claim 19:**

    **Slambrook teaches** an augmented reality system including displaying to the viewer a portion of the virtual selected by the viewer wherein the viewer selection is determined in response to a position of the a viewer-controlled marker with respect to the virtual world, wherein the marker is positioned in the real world **(sections 1.1 and 2.3.2).**

**Regarding claim 20:**

Slambrook **discloses** the visualization method of claim 19, wherein the step of displaying to the viewer the portion of the virtual world selected by the viewer comprises overlaying an icon over the portion of the virtual world displayed to the viewer **(sections 1.1 and 2.2).**

**Regarding claims 21-23:**

Slambrook **discloses** providing the representation of the real world and the virtual world (and super-imposing the virtual world on the real world) in real time **(section 2.2).**

**Regarding claim 24:**

Slambrook **discloses** allowing the viewer to select a satellite or geographic area **(section 1.1).**

**Regarding claim 25:**

Slambrook **discloses** allowing the viewer to directly select and manipulate objects in the virtual world without using a mouse **(section 1.1).**

**Regarding claim 29:**

Slambrook **discloses** tangible medium for storing the software **(inherent).**

## *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are

applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as

follows:

1.    Determining the scope and contents of the prior art.
2.    Ascertaining the differences between the prior art and the claims at issue.
3.    Resolving the level of ordinary skill in the pertinent art.
4.    Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35
U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time
any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the
obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly
owned at the time a later invention was made in order for the examiner to consider the applicability of 35
U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**7.        Claims 6, 13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Slambrook**

**("Three Dimensional Visualization to Support Command and Control") in view of Kato ("Virtual Object**

**Manipulation on a Table-Top AR Environment", 2000).**

**Regarding claims 6 and 13:**

**Slambrook does not explicitly disclose** allowing more than one user to interact with the image. **Kato**

**teaches** the visualization system of claim 1 configured to allow more than one user to interact with the image of the

virtual world at the same time and is configured to allow the more than one user to collaborate with each other while

viewing from different positions **(section 2.1).** At the time of the invention, it would have been obvious to one of

ordinary skill in the arts to combine the teachings of Ralston and Kato because the interface of Kato provides

accurate tracking and registration techniques and an intuitive and useful interface **(Kato: abstract).**

**Regarding claim 26:**

**Slambrook does not explicitly disclose** the use of pre-determined markers in the real world. **Kato teaches**

an augmented reality system including a marker positioned in the real world, the marker is static or placed upon a

paddle that included a pre-defined visual marker in the real world, and the paddle is capable of being moved around

the real world **(Kato: sections 3 and 4).** At the time of the invention, it would have been obvious to one of ordinary skill in the arts to combine the teachings of Slambrook and Kato because the interface of Kato provides accurate tracking and registration techniques and an intuitive and useful interface **(Kato: abstract).**

## *Conclusion*

8.        Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9.        **Examiner's Remarks:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

10.       Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information

Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more

information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the

Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP


**/Kamini S Shah/**

**Supervisory Patent Examiner, Art Unit 2128**